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Degrees:

> BA in Mathematics, summa cum laude, Revelle College, University of California at San Diego, 1977.
> PhD in Computer Science, Stanford University, 1982.
>> Advisor: Joseph Oliger.

Positions:

> Courant Institute of Mathematical Sciences, New York University.
>> NSF Fellow and Visiting Member, 1982–83.
>> Postdoctoral advisor: Charles Peskin.

> University of California at Los Angeles.
>> Hedrick Assistant Professor of Mathematics, 1983–85.

> University of Washington, Departments of Mathematics and Applied Mathematics (joint).
>> Assistant Professor, 1985–1987.
>> Associate Professor, 1987–1990.
>> Professor, 1990–2001.

> University of Washington
>> Professor of Applied Mathematics , since 2001
>> Adjunct Professor of Mathematics , since 2001
>> Adjunct Professor of Earth & Space Sciences, since 2014.

> ETH Zürich, Mathematics Department.
>> Professor, 1990–91.

Visiting Positions:

> Institute for Computer Applications in Science and Engineering (ICASE), NASA Langley.
>> Visiting Scientist, summers, 1983, 1984, 1986.
> ETH Zürich, Forschungsinstitut für Mathematik,
>> Visiting Lecturer, April-July, 1989.
> Courant Institute, New York University,
>> Visiting Member, January-March, 1990.
> National Center for Atmospheric Reserach (NCAR), Boulder, Colorado,
>> Sabbatical visit, 1994–95.
> Newton Institute of Mathematical Sciences, Cambridge
>> Long-term visitor, 2003 and 2012.
> Institute for Mathematics and its Applications (IMA), University of Minnesota,
>> Long-term visitor, 2010.
> Simula Research Laboratory, Oslo,
>> Long-term visitor, Spring 2012.
> Brown University, Division of Applied Mathematics,
>> IBM Visiting Professor, Autumn Semester, 2012.

Awards and Honors:

National Science Foundation Graduate Fellowship, 1977-80.

Hertz Foundation Graduate Fellowship, 1980-82.

National Science Foundation Postdoctoral Fellowship, 1982-83.

Presidential Young Investigator Award, 1987.

NASA Space Act Award (for work with H. Yee), 1995.

Boeing Professor of Applied Mathematics, 2001-02.

Founders Term Professor of Applied Mathematics, 2009-12.

Fellow of the Society of Industrial and Applied Mathematics (SIAM), 2010–.

Fellow of the American Mathematical Society (AMS), 2013–.

Senior Data Science Fellow, UW eScience Insitute, 2014–.

CoMotion Presidential Innovation Fellow, UW, 2015.

Boeing Professor of Applied Mathematics, UW, 2015–.

Selected Invited Lectures

Coxeter Lecturer, Fields Institute, Toronto, 2002

Plenary Lecture, 9th International Conference on Hyperbolic Problems, Caltech, 2002.

Invited Lecture, International Congress of Mathematicians, Madrid, 2006.

Keynote Speaker, DOE Computational Sciences Graduate Fellow Conference, June, 2008.

Invited Lecture, SIAM Annual Meeting, 2008.

School of Earth Sciences Distinguished Lecture, Stanford University, 2014.

Keynote Speaker, EuroSciPy Conference, Cambridge University, 2015.

Richard C. DiPrima Lecture, Rensselaer Polytechnic Institute, 2016.

IMA Public Lecture, University of Minnesota, 2016.

Keynote Speaker, Computational Methods in Water Resources Conference, Toronto, 2016.

Grosswald Lecturer, Temple University, 2016.

Clifford Lecturer, Tulane University, 2017.

Invited Speaker, Equadiff Conference, Bratislava, 2017.

Keynote speaker, International Conference on Computational Science and Engineering, in the memory of Hans Petter Langtangen, Simula, Oslo, October, 2017.

Short Courses Taught

Von Karman Institute for Fluid Dynamics, Rhode Saint Geneèse, Belgium. Series of four lectures in the Lecture Series on Computational Fluid Dynamics, March 5–9, 1990.

German Mathematical Society (DMV) short course on Theory and Numerics of Hyperbolic Conservation Laws, with C. Dafermos, Irsee, Germany, August 29 – Sept. 5, 1993.

Saas-Fee Advanced Course on "Computational Methods for Astrophysical Fluid Flow", with D. Mihalas and E. Müller, Swiss Society of Astrophysics and Astronomy, Le Diablerets, Switzerland, March 3–8, 1997.

Short course on numerical methods for conservation laws, Newton Institute, Cambridge, April 28 – May 2, 2003.

Short course on hyperbolic equations and finite volume methods, Nanjing Normal University, June 27–29, 2007.

Short course on hyperbolic equations and finite volume methods, Schlumberger Research, Houston, January 15–18, 2008.

Co-organizer (with J. Bell and J. Meza) Mathematical Research Communities Conference of Scientific Computing, 2008.

Short course on the Clawpack software, Institute for Mathematics and its Applications (IMA), University of Minnesota, October 4–6, 2010.

Short course on finite volume methods and the Clawpack software, with D. Calhoun, UW RTG IPDE Summer School 2011, June 20 – July 8, 2011.

Short course on Clawpack, WAVES 2011, Vancouver, 2011.

Gene Golub SIAM Summer School on "Simulation and Supercomputing in the Geosciences",
Co-organizer and lecturer, Monterey, July 29 - August 10, 2012.

Tutorial on GeoClaw software, CSDMS Annual meeting, Boulder, May, 2016.

Meeting Organization

Co-organizer, 1st, 7th, 11th, 15th, 19th, and 24th Annual Pacific Northwest Numerical Analysis
Seminars, 1987, 1993, 1997, 2003, 2007, 2013.

Co-organizer (with C. Dafermos and D. Kröner), Oberwolfach Conferences on Hyperbolic Systems of
Conservation Laws, Oberwolfach, Germany, 1992, 1996, 2000, 2004, 2008.

Co-organizer of numerous minisymposia at SIAM conferences.

Co-organizer (with A. Greenbaum and others), SIAM Regional Workshop on Mathematics in Industry,
at the University of Washington, 2000.

Co-organizer (with T. Toro, M. Paulhus, C. Bose), PIMS Industrial Problem Solving Workshop,
University of Washington, 2001.

Scientific Committee, 9th International Conference on Hyperbolic Problems, Caltech, 2002.

Co-organizer (with B. Keyfitz), invited minisymposium on Hyperbolic Conservation Laws, SIAM
Annual Meeting, 2002.

Co-organizer (with J. Ballman, P. G. LeFloch, and E. F. Toro), Conference on Shock Waves in Solid
Materials and Multiphase Flows, Newton Institute, Cambridge, 2003.

Co-organizer (with R. Russell and S. Ruuth), Banff International Research Station (BIRS) Workshop
on Computational Techniques for Moving Interfaces, 2003.

Scientific Committee, Chicago Workshop on Adaptive Mesh Refinement, 2003.

Co-organizer (with M. Choptuik, D. Arnold, L. Lehner, E. Tadmor) Banff International Research
Station (BIRS) Workshop on Numerical Relativity, 2005.

Scientific Committee, Eleventh Int'l Conference on Hyperbolic Problems, Lyon, France, 2006

Co-organizer (with D. Iverson, USGS) Workshop of Landslide and Debris Flow Modeling, Seattle,
2009.

Co-organizer (with M. Kot) Celebration of Applied Mathematics Department, UW, 2009.

Scientific Committee, Thirteenth Int'l Conference on Hyperbolic Problems, Beijing, China, 2010.

Co-organizer (with E. Tadmor, F. Giraldo, K. Ide), Modeling and Computations of Shallow-water
Coastal Flows, University of Maryland, October, 2010.

Steering Committee, 2011 ICIAM meeting, Vancouver.

Satellite and Embedded Meetings Committee, 2011 ICIAM meeting, Vancouver.

Co-organizer (with N. Nigam and others) WAVES 2011, Vancouver.

Co-organizer (with I. Mitchell and V. Stodden) Workshop on Reproducible research: tools and
strategies for scientific computing, Vancouver, 2011.

Co-organizer, Community Forum on Reproducible Research Policies, preceeding ICIAM 2011,
Vancouver.

Co-organizer (with D. Ketcheson, A. Ahmadia, K. Mandli) [HPC]³ Workshop, KAUST, 2012.

Co-organizer (with D. Bailey, J. Borwein, W. Rider, W. Stein, V. Stodden), ICERM Workshop on
Reproducibility in Computational and Experimental Mathematics Brown University, 2012.

Organizing committee, SIAM Computational Science and Engineering Conference, 2013.

Co-organizer, Clawpack Developers' Workshop, UW, 2013.

Scientific Committee, PDESoft Conference, Heidelberg, 2014.

Co-organizer, eScience Reproducibility Workshop, 2014.

Organizing committee, ICERM Workshop on "Mathematics in Data Science", July, 2015.

Co-organizer, Clawpack Developers' Workshop, UW, 2016.

Co-organizer, GeoHack Week Workshops, UW, 2016, 2017.

Co-organizer, GeoClaw Developers' Workshop, University of Colorado, 2018.

Other Recent Professional Service

Member of SIAM Board of Trustees, 2014–2016, 2017–2019.

Member of SIAM Council, 2002–2004, 2005–2007.

Chair, SIAM Journals Committee, 2010–2012, 2013–2015.

Chair, SIAM *ad hoc* Committee on Supplementary Materials, 2010–12.

Editorial Board, SIAM News, 2016–2018.

Survey and Review Section Editor, *SIAM Review*, 2003–2005. Associate Editor, 2005–09.

Associate Editor, *Comm. Appl. Math. and Comput. Sci.* (CAMCOS), 2007–.

Editor, SIAM book series *Fundamentals of Algorithms*, 2011–13.

Member, Scientific Advisory Board, Banff International Research Station (BIRS), 2013–15, 2016–19.

Member, Scientific Advisory board for Center for Scientific Computing at UMass Dartmouth, 2014–16.

Member, Scientific Advisory committee for the CM4 project, PNNL, 2013–2015.

Panelist, National Science Board Expert Panel on Data Policies, 2011.

Panelist, Nuclear Regulatory Commission Workshop on Probabilistic Flood Hazard Assessment, 2013.

Member, Scientific Committee, EGRIN (Ecoulements Gravitaires et RIsques Naturels: Gravity flows and natural hazards), supported by CNRS, 2013–.

Panelist, National Research Council workshop on Statistical Challenges in Assessing and Fostering the Reproducibility of Scientific Results, 2015.

Software Library Steering Committee, 2017–.

Member, Science Steering Committee of the Community Surface Dynamics Modeling System (CSDMS) Cyberinformatics and Numerics Working Group, 2017–20.

Recent Significant University Service

Founding Director of interdepartmental degree program in Applied and Computational Mathematical Sciences (ACMS), 1996–2001. Steering Committee member, 2015–.

Co-PI on interdepartmental VIGRE grant from NSF, 1999–2004.

Faculty Senate representative, 2003–2005, 2005–2007.

Faculty Council on Student Affairs, 2008–11.

Faculty Council on University Libraries, 2012–15, 2015–18.

eScience Executive Committee, 2014–.

M9 Project Steering Committee, 2014–.

NIAC Steering Committee (UW-PNNL), 2015–.

ACMS Undergraduate Degree Program Steering Committee, 2015–.

PhD Students

Twenty three PhD students graduated. See http://faculty.washington.edu/rjl/people.html for a list and links to most theses.

Software

Clawpack — Conservation Laws Package, open source software available from
http://www.clawpack.org

GeoClaw — Software for depth-averaged geophysical flows, open source software available from
http://www.clawpack.org/geoclaw

Books

[B1] Numerical Methods for Conservation Laws, "ETH Lectures in Mathematics" Series, Birkhäuser Verlag, Basel, 1990 (214 pp.).

[B2] Computational Methods in Astrophysical Fluid Flow, by R. J. LeVeque, D. Mihalas, E. Dorfi and E. Müller, Twenty-seventh Saas-Fee Course, (A. Gautschy and O. Steiner, editors) Springer-Verlag, 1998.

[B3] Finite Volume Methods for Hyperbolic Problems, Cambridge University Press, 2002 (557 pp.).

[B4] Finite Difference Methods for Ordinary and Partial Differential Equations, SIAM, Philadelphia, 2007 (350 pp.).

Journal Publications

Recent papers and code can be found at http://faculty.washington.edu/rjl/pubs
Google Scholar Profile: http://scholar.google.com/citations?user=N66WuYOAAAAJ

[J1] Numerically stable methods for updating regressions, with W.B. Gragg and J.A. Trangenstein. J. Amer. Stat. Assoc. 74(1979), pp. 161-168.

[J2] On least squares exponential sum approximation with positive coefficients, with J.W. Evans and W.B. Gragg, Math. Comp. 34(1980), pp. 203-211.

[J3] A test problem for kidney models, with R. Mejia and J.L. Stephenson, Math. Biosci. 50(1980), pp. 129-131.

[J4] Large time-step shock capturing techniques for scalar conservation laws, SIAM J. Numer. Anal. 19(1982), pp.1091-1109.

[J5] Numerical methods based on additive splittings for partial differential equations, with J. Oliger, Math. Comp. 40(1983), pp. 469-497.

[J6] Algorithms for computing the sample variance: analysis and recommendations, with T.F. Chan and G.H. Golub, Amer. Stat. 37(1983), pp.242-247.

[J7] On the uniform boundedness of a family of matrices and applications to one-leg and linear multistep methods, with G. Dahlquist and Huang Mingyou, Numer. Math. 42(1983), pp. 1-13.

[J8] Convergence of a large time step generalization of Godunov's method for conservation laws, Comm. Pure Appl. Math. 37(1984), pp. 463-477.

[J9] Convergence of Godunov's method for a class of 2x2 systems of conservation laws, with B. Temple, Trans. A.M.S. 288(1985), pp.115-123.

[J10] On the resolvent condition in the Kreiss Matrix Theorem, with L.N. Trefethen, BIT 24(1984), pp. 584-591.

[J11] Solution of a two-dimensional cochlea model using transform techniques, with C.S. Peskin and P.D. Lax, SIAM J. Appl. Math. 45(1985), pp. 450-464.

[J12] A large time step generalization of Godunov's method for systems of conservation laws, SIAM J. Numer. Anal. 22(1985), pp. 1051-1073.

[J13] On the accuracy of stable schemes for 2D scalar conservation laws, with J.B. Goodman, Math. Comp. 45(1989), pp. 15-21.

[J14] A geometric approach to high resolution TVD schemes, with J.B. Goodman, SIAM J. Numer. Anal. 25(1988), pp. 268-284.

[J15] Intermediate boundary conditions for time-split methods applied to hyperbolic partial differential equations, Math. Comp. 47(1986), pp. 37-54.

[J16] On the interaction of nearly equal solitons in the KdV equation, SIAM J. Appl. Math. 47(1987), pp. 254-262.

[J17] On the interaction of solitary waves in a modified Boussinesq equation, with P. Clarkson and R. Saxton, Studies Appl. Math. 75(1986), pp. 95-122.

[J18] Second order accuracy of Brenier's time-discrete method for nonlinear systems of conservation laws, SIAM J. Numer. Anal. 25(1988), pp. 1-7.

[J19] Solution of a viscous two-dimensional cochlea model, with C.S. Peskin and P.D. Lax, SIAM J. Appl. Math. 48(1988), pp. 191-213.

[J20] Analysis of the SOR iteration for the 9-point Laplacian, with L.M. Adams and D.M. Young, SIAM J. Numer. Anal. 25(1988), 1156-1180.

[J21] High resolution finite volume methods on arbitrary grids via wave propagation, J. Comput. Phys. 78(1988), pp. 36-63.

[J22] Fourier Analysis of the SOR iteration, with L.N. Trefethen, IMA J. Num. Anal. 8(1988), pp. 273-279.

[J23] A study of numerical methods for hyperbolic conservation laws with stiff source terms, with H.C. Yee, J. Comput. Phys. 86(1990), 187-210.

[J24] Stable boundary conditions for Cartesian grid calculations, with M.J. Berger, Comput. Syst. Engin. 1(1990), 305-311.

[J25] Analysis of a one-dimensional model for the immersed boundary method, with R.P. Beyer, SIAM J. Numer. Anal. 29(1992), pp. 332-364.

[J26] The immersed interface method for elliptic equations with discontinuous coefficients and singular sources, with Z. Li, SIAM J. Numer. Anal. 31(1994), 1019-1044.

[J27] One-dimensional front tracking based on high resolution wave propagation methods, with Keh-Ming Shyue, SIAM J. Sci. Comput. 16(1995), 348–377.

[J28] High-resolution conservative algorithms for advection in incompressible flow, SIAM J. Numer. Anal. 33(1996), 627–665.

[J29] Two-dimensional front tracking based on high resolution wave propagation methods, with Keh-Ming Shyue, J. Comput. Phys. 123(1996), 35–368.

[J30] An immersed interface method for Stokes flow, with Z. Li, SIAM J. Sci. Comput. 18(1997) 709–735.

[J31] Immersed interface methods for wave equations with discontinuous coefficients, with C. Zhang, Wave Motion 25(1997) 237–263.

[J32] Wave propagation algorithms for multi-dimensional hyperbolic systems, J. Comput. Phys. 131(1997), 327-353.

[J33] Adaptive mesh refinement using wave-propagation algorithms for hyperbolic systems, with M. J. Berger, SIAM J. Numer. Anal. 35(1998) 2298-2316.

[J34] Balancing source terms and flux gradients in high-resolution Godunov methods: The quasi-steady wave-propagation algorithm, J. Comput. Phys. 146(1998), 346–365.

[J35] Crack jump conditions for elliptic problems, with A. Wiegmann and Z. Li, Appl. Math. Letters 12 (1999) pp. 81–88.

[J36] High-resolution finite volume methods for acoustics in periodic or random media, with T. Fogarty, J. Acoust. Soc. Am. 106 (1999), pp. 17-28.

[J37] Solving the advection-diffusion equation in irregular geometries, with D. Calhoun. J. Comput. Phys. 156 (2000), pp. 1–38.

[J38] Fractional Step Methods Applied to a Chemotaxis Model, with Rebecca Tyson and L. G. Stern, J. Math. Biol. 41 (2000), 455-475

[J39] A wave propagation method for three dimensional conservation laws, with J.O. Langseth. J. Comput. Phys. 165 (2000) pp. 126-166.

[J40] A modified fractional step method for the accurate approximation of detonation waves, with C. Helzel and G. Warnecke. SIAM J. Sci. Comput. 22 (2000), 1489-1510.

[J41] Moving mesh methods for one-dimensional conservation laws using CLAWPACK, with R. Fazio, Comp. Math. Appl. 45 (2003), 273-298.

[J42] Time evolution of cosmic-ray modified plane shocks, with H. Kang, T. W. Jones and K. M. Shyue. Astrophysical Journal 550 (2001), 737-751.

[J43] A class of approximate Riemann solvers and their relation to relaxation schemes, with M. Pelanti, J. Comput. Phys. 172 (2001), 573-591.

[J44] Finite volume methods for nonlinear elasticity in heterogeneous media, Int. J. Numer. Methods in Fluids. 40 (2002), 93-104.

[J45] A wave-propagation method for conservation laws with spatially varying flux functions, with D. S. Bale, S. Mitran, and J. A. Rossmanith, SIAM J. Sci. Comput. 24 (2002), 955-978.

[J46] Solitary Waves in Layered Nonlinear Media, with D. H. Yong, SIAM J. Appl. Math. 63 (2003), 1539-1560.

[J47] H-box methods for the approximation of one-dimensional conservation laws on irregular grids, with M. J. Berger and C. Helzel, SIAM J. Numer. Anal. 41 (2003), 893-918.

[J48] An immersed interface method for incompressible Navier-Stokes equations, with L. Lee, SIAM J. Sci. Comput. 25 (2003), 832-856.

[J49] The dynamics of pressureless dust, J. Hyperbolic Differential Equations 1(2004), 315-327.

[J50] A high-resolution rotated grid method for conservation laws with embedded geometries, with C. Helzel and M. J. Berger, SIAM J. Sci. Comput. 26 (2005), 785-809.

[J51] A wave propagation algorithm for hyperbolic systems on curved manifolds, with J. A. Rossmanith and D. S. Bale, J. Comput. Phys. 99 (2004), 631-662.

[J52] High-Resolution Finite Volume Methods for Dusty Gas Jets and Plumes, with M. Pelanti, SIAM J. Sci. Comput., 28 (2006) 1335-1360.

[J53] Finite volume methods and adaptive refinement for global tsunami propagation and local inundation, with D. L. George, Science of Tsunami Hazards 24(2006), pp. 319-328.

[J54] Logically Rectangular Grids and Finite Volume Methods for PDEs in Circular and Spherical Domains, with D. A. Calhoun and C. Helzel, SIAM Review 50 (2008), pp. 723-752.

[J55] Correction to the article "A comparison of the extended finite element method with the immersed interface method for elliptic equations with discontinuous coefficients and singular sources by Vaughan et al.", with J. T. Beale, D. L. Chopp, and Zhilin Li, Comm. Appl. Math. Comput. Sci. 3 (2008), pp. 95-100.

[J56] Python Tools for Reproducible Research on Hyperbolic Problems, Computing in Science and Engineering (CiSE) 11 (2009), pp. 19-27 (Special issue on reproducible research.)

[J57] Logically Rectangular Finite Volume Methods with Adaptive Refinement on the Sphere, with M. J. Berger, D. A. Calhoun and C. Helzel, Phil. Trans. Roy. Soc. A 367 (2009), 4483-4496.

[J58] Numerical Approximation of Stiff Reacting Flow, with C. Helzel, invited submission to a volume on Stiff Reactions and Relaxation (G. Puppo and G. Russo, eds.), to appear.

[J59] Reproducible Research: Addressing the Need for Data and Code Sharing in Computational Science. By Yale Law School Roundtable on Data and Code Sharing, Computing in Science and Engineering (CiSE) 12(2010), pp. 8-13

[J60] A Well-Balanced Path-Integral f-wave Method for Hyperbolic Problems with Source Terms. *J. Sci. Comput.*, doi 10.1007/s10915-010-9411-0, 2010

[J61] Universality in the run-up of shock waves to the surface of a star, with C. Gundlach. *J. Fluid Mech.* 676 (2011), pp. 237 - 264.

[J62] The GeoClaw software for depth-averaged flows with adaptive refinement, with M. J. Berger and D. L. George and K. T. Mandli, *Advances in Water Resources* 34 (2011), pp. 1195-1206. (Invited paper)

[J63] Tsunami modeling with adaptively refined finite volume methods, with D.L. George and M.J. Berger, *Acta Numerica* 20(2011) pp. 211 - 289. doi 10.1017/S0962492911000043. (Invited paper)

[J64] Shock Dynamics in Layered Periodic Media, with D. I. Ketcheson, *Comm. Math. Sci.* 10 (2012), pp. 859-874.

[J65] Reproducible Research for Scientific Computing: Tools and Strategies for Changing the Culture, with I. Mitchell and V. Stodden, *Computing in Sci. and Eng.* 14 (2012), 13-17.

[J66] High-Order Wave Propagation Algorithms for General Hyperbolic Systems with D.I. Ketcheson and M. Parsani. *SIAM J. Sci. Comput.* 35 (2013), A351-A377.

[J67] High-resolution finite volume modeling of wave propagation in orthotropic poroelastic media, with G. I. Lemoine and M. Y. Ou. *SIAM J. Sci. Comput.* 35(2013), B176-B206.

[J68] Comparison of earthquake source models for the 2011 Tohoku-oki event using tsunami simulations and near field observations, with B. T. MacInnes, A. R. Gusman, and Y. Tanioka, *Bull. Seis. Soc. Amer.* 103(2013), pp. 1256-1274.

[J69] Computational Models of Material Interfaces for the Study of Extracorporeal Shock Wave Therapy, with K. Fagnan. *Comm. Appl. Math. and Comput. Sci.* 8(2013), 159–194.

[J70] Validating velocities in the GeoClaw tsunami model using observations near Hawaii from the 2011 Tohoku tsunami, with M.E.M. Arcos. *Pure Appl. Geophys.* 172 (2015), pp. 849-867. https://doi.org/10.1007/s00024-014-0980-y

[J71] The pattern method for incorporating tidal uncertainty into probabilistic tsunami hazard assessment (PTHA), with L. M. Adams, and F. I. González, *Natural Hazards* 76(2015), pp. 19-39.

[J72] M. J. Del Razo, Y. Morofuji, J. S. Meabon, B. R. Huber, E. R. Peskind, W. A. Banks, P. D. Mourad, R. J. Leveque and D. G. Cook, Computational and in vitro studies of blast-induced blood-brain barrier disruption, *SIAM J. Sci. Comput.* 39 (2017), pp. B486–B507, 10.1137/15M1010750.

[J73] M. J. Del Razo, R. J. LeVeque, Computational study of shock waves propagating through air-plastic-water interfaces, Bull. Braz. Math. Soc., New Series, 47(2016), 685-700, 10.1007/s00574-016-0178-2

[J74] The Clawpack 5.X Software, with K. T. Mandli, A. J. Ahmadia, M. J. Berger, D. A. Calhoun, D. George, Y. Hadjimichael, D. I. Ketcheson, G. I. Lemoine, to appear in *PeerJ Computer Science*, 2016.

[J75] Adjoint Methods for Guiding Adaptive Mesh Refinement in Tsunami Modeling, with Brisa N. Davis, *Pure & Applied Geophysics* 173 (2016), pp. 4055-4074.

[J76] Generating Random Earthquake Events for Probabilistic Tsunami Hazard Assessment, with K. Waagan, F. I. González, D. Rim, and G. Lin, *Pure & Applied Geophysics* 173 (2016) pp. 3671-3692.

[J77] Kinematic Rupture Scenarios and Synthetic Displacement Data: An Example Application to the Cascadia Subduction Zone, with D. Melgar, D. S. Dreger, and R. M. Allen, *J. Geophys. Res. – Solid Earth* 121(2016), pp. 6658-6674.

[J78] Numerical methods for interface coupling of compressible and almost incompressible media, with M. del Razo, *SIAM J. Sci. Comput.* 39 (2016), pp. B486B507, https://doi.org/10.1137/16M1067834

[J79] A Boussinesq type extension of the GeoClaw model - a study of wave breaking phenomena applying dispersive long wave models, with J. Kim, G. K. Pedersen, and F. Løvholt, *Coastal Engineering* 122 (2017), pp. 75-86.

[J80] A High-Resolution Finite Volume Seismic Model to Generate Seafloor Deformation for Tsunami Modeling, with C.J. Vogl, *J. Sci. Comput.* 2017, 12041215, https://doi.org/10.1007/s10915-017-0459-y.

[J81] Probabilistic Tsunami Hazard Analysis: Multiple Sources and Global Applications, with A. Grezio, A. Babeyko, M. A. Baptista, J. Behrens, et al. *Reviews of Geophysics* 55 (2017), pp. 1158-1198. https://doi.org/10.1002/2017RG000579.

[J82] Transport reversal for model reduction of hyperbolic partial differential equations, with D. Rim and S. Moe, *SIAM/ASA Journal on Uncertainty Quantification* 6(2018), pp. 118-150.

Book and Encyclopedia Chapters

[C1] Tsunami Modeling, entry in the *Princeton Companion to Applied Mathematics* (N. Higham, Editor), Princeton University Press. 2015. http://faculty.washington.edu/rjl/pubs/pcam-tsunami

[C2] Reproducibility: Methods, entry in the *Encyclopedia of Applied and Computational Mathematics*, Springer (B. Engquist, Editor). 2015. http://faculty.washington.edu/rjl/pubs/eacm2012

[C3] Producing a Journal Article on Probabilistic Tsunami Hazard Assessment, to appear in *The Practice of Reproducible Research* (J. Kitzes, D. Turek, F. Imamoglu, eds.), 2017.

Conference Proceedings

[P1] Extensions and uses of the variable projection algorithm for solving nonlinear least squares problems, with G.H. Golub, Proc. 1979 Army Num. Anal. and Computers Conf., ARO Report 79-3, 1979, pp. 1-12.

[P2] Updating formulae and a pairwise algorithm for computing sample variances, with T.F. Chan and G.H. Golub, Compstat 1982, Proc. 5th Symp. held at Toulouse, France (H. Caussinus, et. al., eds.), 1982, pp. 30-41.

[P3] Total variation diminishing schemes in one and two space dimensions, with J.B. Goodman, Lectures in Appl. Math. 22 (1985), pp. 51-62.

[P4] Some preliminary results using a large time step generalization of Godunov's method, in Numerical Methods for the Euler Equations of Fluid Dynamics (F. Angrand, et.al., eds.), SIAM, Philadelphia, 1985, pp. 32-47.

[P5] Shock-tracking with the large time step method, Proc. 7th Int'l Conf. Comp. Methods Appl. Sci. Eng. (R. Glowinski, J.L. Lions, eds.), Versailles, 1985.

[P6] Cartesian grid methods for flow in irregular regions, in Numerical Methods in Fluid Dynamics III (K.W. Morton and M.J. Baines, eds.), Clarendon Press, Oxford, 1988, pp. 375-382.

[P7] An Adaptive Cartesian Mesh Algorithm for the Euler Equations in Arbitrary Geometries, with M. Berger, Paper AIAA-89-1930, 1989 AIAA Meeting, Buffalo, NY.

[P8] Hyperbolic conservation laws and numerical methods, Von Karman Institute Lecture Series 1990-03.

[P9] Cartesian meshes and adaptive mesh refinement for hyperbolic partial differential equations, with M. Berger, Proc. 3rd Intl. Conf. Hyperbolic Problems, Uppsala, Sweden, 1990.

[P10] A Rotated Difference Scheme for Cartesian Grids in Complex Geometries, with M. Berger, AIAA Computational Fluid Dynamics Conference, Hawaii, 1991.

[P11] Grid Alignment Effects and Rotated Methods for Computing Complex Flows in Astrophysics, with R. Walder, GAMM Conference on Computational Fluid Dynamics, Lausanne, 1991.

[P12] Cartesian grids and rotated difference methods for multi-dimensional flow, Proc. Int'l. Conf. Sci. Comput., Hangzhou, China, 1991.

[P13] Simplified Multi-dimensional flux limiter methods, *Numerical Methods for Fluid Dynamics 4*, M. J. Baines and K. W. Morton, editors, Clarendon Press, Oxford, 1993, pp. 175–190.

[P14] A linear hyperbolic system with stiff source terms, with Wang Jinghua, Proc. 4th Int'l Conf. Hyperbolic Problems, Taormina, Italy, 1992.

[P15] Finite volume methods for irregular one-dimensional grids, with M. J. Berger and L. G. Stern, Proc. *Mathematics of Computation* Anniversary Meeting, Vancouver, 1993.

[P16] CLAWPACK — A software package for solving multi-dimensional conservation laws, Proc. 5th International Conference on Hyperbolic Problems, Stony Brook, June, 1994, (J. Glimm et. al., eds.), World Scientific Press, 1996, pp. 188-197.

[P17] Finite Difference Methods for Wave Equations with Discontinuous Coefficients, with Chaoming Zhang, to appear in ASCE Engineering Mechanics Conference, 1995.

[P18] Immersed interface methods for bubble computations, with Z. Li, Proc. Sixth International CFD Conference, 1995, pp. 688-693.

[P19] Three-dimensional Euler computations using CLAWPACK, with J. O. Langseth, Conf. on Numer. Meth. for Euler and Navier-Stokes Equations, Montreal, 1995.

[P20] Wave-Propagation Methods for Conservation Laws with Source Terms, with D. S. Bale, Proc. 7'th Intl. Conf. on Hyperbolic Problems, (R. Jeltsch, editor), Zurich, 1998.

[P21] High-Resolution Finite Volume Methods for Acoustics in a Rapidly-Varying Heterogeneous Medium, with T. Fogarty, Proc. Fourth Int. Conf. on Wave Propagation, Golden, CO, SIAM, 1998.

[P22] CLAWPACK and AMRCLAW — Software for High-Resolution Godunov Methods", Proc. Fourth Int. Conf. on Wave Propagation, Golden, CO, SIAM, 1998.

[P23] Cartesian Grid Methods for Fluid Flow in Complex Geometries, with D. Calhoun. To appear in Proc. IMA Workshop on *Computational Modeling in Biological Fluid Dynamics*, 1999.

[P24] A wave propagation algorithm for the solution of PDEs on the sphere, with J. Rossmanith, submitted to Proc. 8'th Intl. Conf. on Hyperbolic Problems, 2000.

[P25] Wave propagation algorithms for hyperbolic systems on curved manifolds, with D. Bale, to appear in Proc. 8'th Intl. Conf. on Hyperbolic Problems, 2000.

[P26] Moving-mesh methods for one-dimensional hyperbolic problems, with R. Fazio, IV Congresso Nazionale SIMAI, Giardini-Naxos, 1998, pp. 314-317.

[P27] Wave-propagation methods and software for complex applications, with S. Mitran, Proc. Third International Symposium on Finite Volumes for Complex Applications, 2002.

[P28] Phase Plane Behavior of Solitary Waves in Nonlinear Layered Media, with D. Yong, Hyperbolic Problems: Theory, Numerics, Applications, 9'th Intl. Conf. on Hyperbolic Problems (T. Hou and E. Tadmor, eds.), 2002, pp. 43-51.

[P29] An accuracy study of mesh refinement on mapped grids with D. Calhouni. Adaptive Mesh Refinement — Theory And Applications: Proceedings of the Chicago Workshop on Adaptive Mesh Refinement Methods (T. Plewa, Ed.), Springer Verlag, Lecture Notes in Computational Science and Engineering, Vol. 41 (2003) pp. 91-102.

[P30] High-resolution finite volume methods for the shallow water equations with bathymetry and dry states, with D. L. George, Proceedings of Long-Wave Workshop, Catalina, 2004, to appear in *Advanced Numerical Models for Simulationg Tsunami Waves and Runup* (P. L-F. Liu, H. Yeh, C. Synolakis, eds.), Advances in Coastal and Ocean Engineering, Vol 10.

[P31] WENOCLAW: A higher order wave propagation method, with D. I. Ketcheson, to appear in Proceedings of the Eleventh Int'l Conference on Hyperbolic Problems, Lyon, 2006.

[P32] High-resolution finite volume methods for extracorporeal shock wave therapy, with K. Fagnan, T. J. Matula and B. MacConaghy, to appear in Proceedings of the Eleventh Int'l Conference on Hyperbolic Problems, Lyon, 2006.

[P33] High resolution methods and adaptive refinement for tsunami propagation and inundation, with D. L. George, to appear in Proceedings of the Eleventh Int'l Conference on Hyperbolic Problems, Lyon, 2006.

[P34] A finite volume grid for solving hyperbolic problems on the sphere, with Donna A. Calhoun and Christiane Helzel, to appear in Proceedings of the Eleventh Int'l Conference on Hyperbolic Problems, Lyon, 2006.

[P35] Wave propagation software, computational science, and reproducible research, Proc. Int. Cong. Math. (M. Sanz-Solé and J. Soria and J. L. Varona and J. Verdera, eds.), 2006, pp. 1227-1254.

[P36] Two-layer shallow water system and its applications, with J. Kim, Proceedings of the Twelfth Int'l Conference on Hyperbolic Problems, 2008. Proc. Symp. Appl. Math. 67.2(2009), pp. 737-743.

[P37] GeoClaw Model Chapter, with F. I. González, P. Chamberlain, B. Hirai, J. Varkovitzky, and D. L. George, to appear in National Tsunami Hazard Mitigation Program. Proceedings and Results of the 2011 NTHMP Model Benchmarking Workshop. Boulder: U.S. Department of Commerce/NOAA/NTHMP; (NOAA Special Report) 2012. http://www.clawpack.org/geoclaw.

[P38] Observations and Modelling of Tsunami Currents at the Port of Tauranga, New Zealand, with J. C. Borerro, S. D. Greer, S. O'Neill, and B. N. Davis, Australasian Coasts & Ports Conference 2015 (J. C. Borrero et al., eds.), pp. 20-95, ISBN 9781922107794. https://search.informit.com.au/documentSummary;dn=703156566786424;res=IELENG

[P39] Assessing tsunami risk to Karachi port through simulation of currents that were reportedly produced there by the 1945 Makran tsunami, with H. Hasan, H. A. Lodhi, S. H. Lodi, S. Ahmed, 16th World Conference on Earthquake, Santiago Chile, 2017.

Book reviews

[BR1] Adaptive Finite Element Solution Algorithm for the Euler Equations, by R. A. Shapiro, SIAM Review 35(1993), p. 531.

[BR2] Numerical Approximation of Hyperbolic Systems of Conservation Laws, by E. Godlewski and P.-A. Raviart, SIAM Review 40(1998), 160–162.

[BR3] Numerical Methods for Wave Propagation, by E. F. Toro and J. F. Clarke (Eds.), AIAA Journal (to appear).

[BR4] Fundamentals of Computational Fluid Dynamics, by H. Lomax, T. H. Pulliam, and D. W. Zingg, SIAM Review, (to appear).

[BR5] A First Course in the Numerical Analysis of Differential Equations, by A. Iserles, SIAM Review (to appear).

Miscellaneous publications

[M1] Python for Scientific Computing at CSE 2009 with F. Perez and H. P. Langtangen, SIAM News 42, Number 5, June 15, 2009. http://www.siam.org/news/news.php?id=1595.

[M2] Modeling Hazardous Mass Flows (meeting report), with R. Iverson, EOS, Vol. 90, No. 23., 2009, p. 201.

[M3] Measurements of acoustic energy deflection in the presence of replica bone, with Tom Matula, Brian MacConnaghy, Randal Ching, and Kirsten Fagnan, International Society for Medical Shockwave Treatment Newsletter, Volume 6, Number 1, 2010, pp. 20-22. http://www.ismst.com/pdf/ISMST_Newsletter_2010-06_No6.pdf

[M4] Modeling and Simulating Tsunamis with an Eye to Hazard Mitigation, with J. Behrens, SIAM News 44, Number 4, May, 2011. http://www.siam.org/news/news.php?id=1882.

[M5] Top Ten Reasons to *Not* Share Your Code (and why you should anyway), to appear in SIAM News, http://faculty.washington.edu/rjl/pubs/topten.

Technical Reports

[TR1] Computations related to G-stability of linear multistep methods, with G. Dahlquist and D. Andree. Stanford Computer Science Report No. STAN-CS-79-738, 1979.

[TR2] Numerical analysis program library user's guide, with J.H. Bolstad et. al., SLAC Computing Services User Note #82, 1979.

[TR3] Linear difference equations and matrix theorems, with G. Dahlquist, Royal Institute of Technology report, 1980.

[TR4] Time-split methods for partial differential equaions, PhD Thesis, Stanford Computer Science Report No. STAN-CS-82-904, 1982.

[TR5] Intermediate boundary conditions for LOD, ADI, and approximate factorization methods, ICASE Report 85-21, NASA Langley Research Center, 1985.

[TR6] Some traffic flow models illustrating interesting hyperbolic behavior, 2001.
       ftp://amath.washington.edu/pub/rjl/papers/traffic.ps.gz

[TR7] Clawpack documentation, http://www.clawpack.org, 2006–.

[TR8] Probabilistic Tsunami Hazard Assessment (PTHA) for Crescent City, CA. Final Report for Phase I with F. González and L. M. Adams, February, 2013 (70 pp.).
       http://hdl.handle.net/1773/22366

[TR9] Tsunami Hazard Assessment of the Ocosta School Site in Westport, WA. Final report. with F. González and L. M. Adams, March, 2013 (11 pp.). Available on request.

[TR10] Tsunami Hazard Assessment of the Elementary School Berm Site in Long Beach, WA. Final report. with F. González and L. M. Adams, April, 2013 (13 pp.).
       http://hdl.handle.net/1773/22705

[TR11] Adjoint Methods for Guiding Adaptive Mesh Refinement in Wave Propagation Problems, with B. N. Davis, http://arxiv.org/abs/1511.03645, 2015.

[TR12] Tsunami Hazard Assessment of the Strait of Juan de Fuca, with F. González and L. M. Adams, April, 2015 (87 pp.).

[TR13] Tide Gauge Comparisons of MOST and GeoClaw Tsunamis, with L. M. Adams, Submitted to NOAA/PMEL, 2017.

[TR14] Tsunami Hazard Assessment of Snohomish County, Washington, with F. I. González and L. M. Adams, Submitted to WA State Emergency Management Division, 2018.

[TR15] Long Beach Berm Modeling Study, with F. I. González, Submitted to WA State Emergency Management Division, 2018 (31 pp.).